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VOLUNTEERING AND IMAGE CONCERNS

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Abstract

We design an experiment to analyze the impact of image concerns and material incentives on volunteering. Our design retains the advantages of laboratory control while incorporating field context by engaging subjects in an actual nonprofit's operation. We find that working in a public setting significantly increases volunteering. Monetary incentives have little impact, although they are slightly more effective in a private setting. Our results suggest that organizations have more to gain by catering to volunteers' image concerns than by providing monetary benefits.

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Introduction

A quarter of Americans volunteer on average an hour a week (Bureau of Labor Statistics, 2006), making volunteer work a crucial private contribution to the nonprofit sector.[1] Nonprofits invest large amounts of energy and money to recruit and motivate volunteers, using strategies such as sending out pamphlets urging individual action, organizing volunteer groups, and offering rewards such as gift certificates, parking reimbursement and public recognition. Policy makers, recognizing the role of volunteers in providing public goods, further encourage contributions by offering a variety of tax deductions. Offers of material and recognition rewards have become common practice in spite of limited empirical evidence about their effectiveness. Our paper attempts to draw on current theoretical advances in the study of prosocial behavior to experimentally investigate whether these incentives work and pinpoint the causal mechanisms behind them.

The reason individuals engage in prosocial behavior such as volunteering or donating money has long interested economists. Recent evidence suggests that while giving may depend on altruism or "warm glow" as in Andreoni (1989), concern for social image may also be a driving force. Funk (2006) finds a decrease in voter participation after the introduction of mail order voting in Switzerland made the action less public. Similarly, Andreoni and Bernheim (2007) observe that the frequency of equal (50-50) splits in one shot dictator games decreases as the probability that the dictator's decision will remain hidden increases. This evidence is supportive of signaling models where individuals care about what observers think about them and therefore engage in prosocial behavior to send positive signals about their altruism.

Behind this empirical and experimental evidence there is a growing theoretical literature that models prosocial behavior as a signaling device.[2] This paper uses the theoretical framework of Benabou and Tirole (2006)'s model; an individual's utility function incorporates altruistic benefits (including both warm glow and utility from increasing public

[1] Hodgkinson and Weitzman (1994) report that in 1990, Americans gave $100 billion in funds, and an estimated $182.3 billion worth of volunteer labor.

[2] For example Bernheim (1994), Seabright (2002), and Benabou and Tirole (2003)

good provision), material benefits from rewards and image benefits. The model throws the importance of image concerns into sharp focus,[3] illustrating why incentives designed to stimulate prosocial behavior may have the reverse effect if the incentives creates doubt about individuals' altruistic motives.

The reduction of prosocial behavior in response to incentives is known as *crowding out*. This phenomenon is recorded in a growing body of empirical evidence in psychology and economics.[4] Beginning with Frey and Oberholzer-Gee (1997), theoretical models of crowding out share one central component: monetary incentives reduce the intrinsic utility of engaging in prosocial behavior. Crowding out happens when this decrease in intrinsic benefit is larger than the gain in utility from external incentives. However, until recent work by Ariely, Bracha, and Meier (2007), there has been no empirical evidence identifying the mechanism that drives crowding out. In their experiments subjects repeatedly press keys or ride a stationary bike to donate money to charity. Their evidence is consistent with BT's signaling model; image motivations are the mechanism behind crowding out.

Our paper studies the impact of heightened observability and small monetary rewards on individuals working on an everyday volunteering task. Our experimental task involves the subject directly in the production of services for an organization. We worked closely with the Los Angeles based nonprofit School On Wheels (SOW) to select an administrative task that contributes directly to their services for the homeless. Subjects know that all the work they perform will be sent to SOW and will be used as an important resource for the organization. Our experiment is designed to measure the importance of social image in motivating volunteers through a controlled comparison of volunteering behavior in public and private. The observability of actions in our experiment is subtle; our experimental design does not artificially call attention to the amount of contribution, instead we focus on the extent to which an individual's altruism can be inferred by observing his contribution. This connects our experiment with volunteer management in practice, where the volunteers are organized to work in institutional settings with varying degree of observability. For instance, compare a situation in which a group of volunteers sorts trash together at a recycling center to one in which volunteers individually sort trash in their own homes and then deposit it at the recycling center. In the first setup, an authority figure such as a volunteer organizer is usually present and contributions are always detected by observers (such as other volunteers). We define this setup as the *public* setting. In the second setup, not only is there no organizer, but contributions can also go undetected since a person may have sorted and deposited recyclables without being seen by anyone. In this situation there is less social pressure to contribute since a person that is not seen to be working is not necessarily exhibiting a lack of altruism. We refer to this setup as the *private* setting. This difference in privacy affects image benefits by changing the amount of shame associated with lack of volunteering; Section 2 of our

[3]The model explains how the volunteering setting is affected by the visibility of actions and modeled complex components of image such as honor, shame and social norms.

[4]Frey and Jegen (2001) survey evidence from economics. The first experimental studies in the field documenting this evidence were conducted by Gneezy and Rustichini (2000).

paper will discuss the theoretical implication of this setup within Benabou and Tirole (2006)'s framework.

The image treatment in our experiment simulates the difference in public and private volunteering described above. Our double blind design removes the experimenter from the room and protects subjects' decision from scrutiny by using a random mechanism that limits the amount of time they may spend volunteering with some probability. Combined with the realism of the experimental task, this design allows us to replicate organizational constraints more closely and analyze the efficacy of monetary incentives within these constraints.

Prosocial behavior has been studied in both lab and field settings, however, the use of lab experiments to study prosocial behavior has been the subject of recent methodological discussion. Levitt and List (2007) argue that lab experiment findings on prosociality may not generalize well to naturally occurring environment due to a higher level of scrutiny, the abstract environment of the lab, and the selection effect of participants in the lab experiment. Our lab setup actually takes advantage of the scrutiny inherent in the laboratory and builds it into an experimental treatment. We respond to concerns about the abstractness of the environment by working closely with a nonprofit in designing our experimental volunteering task.

The rest of the paper proceeds as follows. In Section 2 we describe the theoretical model which we use to derive our theoretical hypothesis. In Section 3 we describe our experimental design and survey. The results of the experiments are presented in Section 4. Section 5 concludes. The appendix contains experimental instructions, screen shots of the volunteering task, and the survey questions.

Theoretical Model

Several signaling models have been proposed to describe how prosocial behavior responds to incentives, such as Benabou and Tirole (2003, 2006), Seabright (2006), and Ellingsen and Johanssen (2006). The Benabou and Tirole (2006) model, henceforth BT, does not use the standard principal agent setup, and is therefore flexible enough to also include signaling to non-principal observers. We use the framework of BT to generate testable predictions about whether image concerns motivate prosocial behavior and the implication this has on monetary incentives. In the model, individuals have subjective preferences on three dimensions: altruism, monetary rewards and image concerns. These preferences can be heterogeneous. Agents choose the level of prosocial behavior that maximizes their utility.

Let v_a represent an agent's underlying altruism and v_y be the agent's subjective value for money. We assume valuations (v_a, v_y) to be normally distributed:

$$\begin{pmatrix} v_a \\ v_y \end{pmatrix} \sim N\left(\begin{bmatrix} \bar{v}_a \\ \bar{v}_y \end{bmatrix}, \begin{bmatrix} \sigma_a^2 & \sigma_{ay} \\ \sigma_{ay} & \sigma_y^2 \end{bmatrix}\right), \quad \bar{v}_a \geq 0, \bar{v}_y \geq 0$$

Let $\theta = \frac{\sigma_y}{\sigma_a}$ stand for noise to signal ratio. When $\theta > 1$, there is more uncertainty in the population about the subjective valuation for money than the subject valuation for altruism.

Let an individual's concern about appearing altruistic be γ_a and his concern for appearing greedy be γ_y. We assume both γ_a and γ_y to be positive, that is, individuals want to appear altruistic and do not want to appear greedy. Now let x be the visibility of volunteering. Let $C(a)$ be the cost of volunteering a minutes.

An individual with type $(v_a, v_y, \gamma_a, \gamma_y)$ who faces wage reward y and visibility x has the following utility for volunteering a minutes:

$$u(a|y,x) = (v_a + v_y y)a - C(a) + x\left(\gamma_a E(v_a|a,y) - \gamma_y E(v_y|a,y)\right) \tag{1}$$

We now discuss the differences between public volunteering and private volunteering. In our theoretical model we incorporate two components of the difference between public and private volunteering. First of all, actions are more visible in public volunteering than in private volunteering. We specify $x_V \geq 0$ as the level of visibility for private volunteering and $x_{PU} > x_V$ as the visibility of public volunteering. Second, the private setting introduces many alternative explanations for an individual's lack of observed contribution that has nothing to do with her type (v_a or v_y). A person that was not observed working might have volunteered undetected or may be facing some circumstance that prevented her from working.

Let $p \in [0,1]$ be the probability that lack of observed contribution at minute a is due to something other than an individual's altruism. With the presence of this noise, individuals that are no longer working at time a have as much altruism as those who are still working with probability p. In private volunteering, $0 < p < 1$. In public volunteering, $p = 0$ since one cannot hide their decision to not contribute.

Let $r(a,y)$ express the gain in reputation from participating an extra minute of volunteering:

$$r(a,y) = x\left[\gamma_a(E(v_a|a,y) - ((1-p)E(v_a|a-1,y) + pE(v_a|a,y))) - \right.$$
$$\left.\gamma_y(E(v_y|a,y) - ((1-p)E(v_y|a-1,y) + pE(v_y|a,y)))\right.$$

Lemma:

Marginal reputation benefit in private volunteering is smaller than the marginal reputation benefit in public volunteering.

$$r_V(a,y) < r_{PU}(a,y) \tag{2}$$

Proof:

$$r_V(a,y) = x_V(1-p)(\gamma_a[E(v_a|a,y) - E(v_a|a-1,y)] - \gamma_y[E(v_y|a,y) - E(v_y|a-1,y)]$$

$$r_{PU}(a,y) = x_{PU}(\gamma_a[E(v_a|a,y) - E(v_a|a-1,y)] - \gamma_y[E(v_y|a,y) - E(v_y|a-1,y)]$$

Since $x_V(1-p) < x_{PU}$, $r_V(a,y) < r_{PU}(a,y)$.

From Proposition 1 in BT, assuming in a population with image concerns (γ_a, γ_y) and noise to signal ratio θ, average volunteered minutes will be:

$$\bar{a}(y,x) = \frac{\bar{v}_a + \bar{v}_y y}{k} + x\left(\frac{\gamma_a - \gamma_y y\theta^2}{1 + y^2\theta^2}\right) \tag{3}$$

We will simulate private volunteering with our double blind treatment. Let $x_{DB} = x_V * (1-p)$. We can now derive the three hypotheses that will be tested in our experiments.

Image Hypothesis

When no monetary incentive is offered, more minutes will be volunteered in public than in private.

$\mathrm{x}_{PU} > x_{DB} \geq 0 \Rightarrow \bar{a}(0, x_{PU}) > \bar{a}(0, x_{DB})(4)$

Proof:

$$\bar{a}(0, x_{PU}) - \bar{a}(0, x_{DB}) = \gamma_a(x_{PU} - x_{DB}) > 0 \text{ since } \gamma_a > 0 \textit{ by assumption.}$$

Wage-Effect Hypothesis

There exists small positive level of visibility where introducing wages will increase volunteering. In other words, volunteers will respond positively to monetary incentives when the setting is adequately private.

Let $y > 0$. Then

$$\bar{a}(y, x) > \bar{a}(0, x) \textit{ for } 0 \leq x < \frac{\bar{v}_y}{k}\left(\frac{\frac{1}{\theta^2} + y^2}{\gamma_a y + \gamma_y}\right) \tag{5}$$

Proof:

$$\bar{a}(y, x) - \bar{a}(0, x) = \frac{\bar{v}_y y}{k} + x\left(\frac{\gamma_a - \gamma_y y\theta^2}{1 + y^2\theta^2} - \gamma_a\right)$$

Volunteering respond positively to wages when $\bar{a}(y, x) - \bar{a}(0, x) > 0$, which is achieved when x is small:

$$x\left(\frac{\gamma_y y\theta^2 + \gamma_a y^2\theta^2}{1 + y^2\theta^2}\right) < \frac{\bar{v}_y y}{k}$$

Since $\bar{v}_y, k, \gamma_a, \gamma_y, \theta, y \geq 0$, both left and right hand terms are positive.

$$0 \leq x < \frac{\bar{v}_y}{k}\left(\frac{\frac{1}{\theta^2} + y^2}{\gamma_a y + \gamma_y}\right)$$

Hence for any population parameter that satisfy $\bar{v}_y, \gamma_a, \gamma_y, \theta \geq 0$, there exist a range of visibility $x \geq 0$ that is low enough for monetary reward y to increase volunteering.

Partial Crowding Out Hypothesis

Volunteers will respond less positively to monetary incentives in a public setting than in a private setting. This happens because the same amount of monetary incentive results in a larger loss of image benefit in a public setting than in a private setting.

$$x_{PU} > x_{DB} \geq 0 \Rightarrow \ \forall\ y > 0\ \bar{a}(y, x_{PU}) - \bar{a}(0, x_{PU}) < \bar{a}(y, x_{DB}) - \bar{a}(0, x_{DB}). \qquad (6)$$

Proof:
First note that:

$$\bar{a}(y, x) - \bar{a}(0, x) = \frac{\bar{v}_y y}{k} + x\left(\frac{\gamma_a - y\gamma_y\theta^2}{1 + y^2\theta^2} - \gamma_a\right)$$

Rewrite Eq 4 as:

$$\frac{\bar{v}_y y}{k} + \gamma x_{PU}\left(\frac{\gamma_a - y\gamma_y\theta^2}{1 + y^2\theta^2} - \gamma_a\right) < \frac{\bar{v}_y y}{k} + \gamma x_{DB}\left(\frac{\gamma_a - y\gamma_y\theta^2}{1 + y^2\theta^2} - \gamma_a\right)$$

$$(x_{PU} - x_{DB})\frac{\gamma_a - y\gamma_y\theta^2}{1 + y^2\theta^2} < (x_{PU} - x_{DB})\gamma_a$$

$$\gamma_a - y\gamma_y\theta^2 < \gamma_a(1 + y^2\theta^2)$$

$$-\gamma_y < \gamma_a y$$

which is always true for $\gamma_a, \gamma_y, y > 0$.

Note that we will not be testing net crowding out, which describes situations where average volunteering actually decreases as a result of introducing incentives. The exact level of visibility and amount of monetary incentive x, y that will induce net crowding out depends critically on population parameters that cannot be estimated in our experiment. Instead we will be testing partial crowding out, that is whether the response to monetary incentive is greater in public volunteering than in private volunteering.

Our main hypothesis, the **image hypothesis**, predicts that the institutional setting where volunteering takes place will significantly affect the amount of labor donated. A public setting results in higher visibility not only because a coordinator is usually present, but also because an individual's lack of observed contribution can directly be interpreted as a signal of his low altruism. The noise in observability inherent in private volunteering reduces this negative signal. If people care about being seen as altruistic, a change of institutional setting from private to public will induce more volunteering.

The next two hypothesis tests the interaction between institutional setting and material incentive on volunteering. The **wage effect hypothesis** states that if the private setting offers low enough visibility, more time will be volunteered when wages are offered. The **partial crowding out hypothesis** states that monetary incentives are always more effective (or less damaging) for private volunteering than public volunteering due to the smaller loss in image benefit in a private setting. The next section describes the design of our experiment in detail.

Experimental Design

We ran a series of lab experiments to examine whether image concerns affect individuals' decisions about how much to volunteer and the implication this has on the effectiveness of monetary incentives. Levitt and List (2007) propose three potential limitations of generalizing from lab results to other environments: scrutiny given to actions in the lab, the unnatural context of the lab environment and subject selection. While our experiment uses the standard laboratory subject pool of college students,[5] we address the remaining critiques of laboratory experiments directly in our design. First, we use the scrutiny inherent in the lab as an element of our image treatment. Second, we require that our task engage subjects directly with the organization's mission to alleviate the abstract setting of lab experiments.

We partnered with School On Wheels (SOW), a Los Angeles nonprofit that tutors homeless children. We chose an educational youth services organization because this is the fastest growing segment in volunteering and therefore representative of newly recruited individuals.[6] To fulfill SOW's request for a database of local resources to extend services to their clients, subjects in our experiment searched online for contact information from a list of organization types and cities given by SOW. This task is realistic because it is comparable to what actual SOW volunteers would do; the frustration and successes that is inherent in most volunteering situation is present in this laboratory experiment.

Pilot tests of the laboratory experiments took place at Caltech from January to February 2007. The Caltech subject pool is small relative to frequency of experimental activity on campus. We therefore conducted actual experiments with students at Claremont McKenna College (March-May 2007 and October 2007).[7] Claremont McKenna subjects were recruited through an email publicizing an opportunity to participate in an experiment on decision making. Subjects were not aware that the experiment would study volunteering.

The experiment consisted of two stages: training and volunteering. The training session lasted 15 minutes; the experimenter briefly introduced the nonprofit SOW, explained the volunteering task and its importance, and the lab protocols. These instructions are included in the appendix. The task was internet search and data entry. Subjects first

[5] Among the 65.4 million Americans who has volunteered at least once in 2005, 3.3 million of them are current college students (Bureau of Labor Statistics). We attempted to address this issue by replicating this lab experiment with actual SOW tutors. While we recruited from the pool of available tutors, this experiment did not have adequate statistical power. Nonetheless, the results are qualitatively similar to experiments reported in this paper. We are continuing to pursue research that broadens the subject pool for our experiment.

[6] The percentage of volunteers in youth-services organizations nearly doubled from 15.1% in 1989 to 27% in 2006, bringing their total number second only to religious organizations (Bureau of Labor Statistics).

[7] While the pilot involved few subjects, the conclusions from the pilot conducted at Caltech are qualitatively similar to the results reported here from experiments with students at Claremont. The pilot results are available from the authors on request.

practiced the task by looking for the contact information for the Rotary Club in Pasadena; this gives them the opportunity to ask questions and ensures that the cost of effort is known at the start of the volunteering stage. For their participation in the training session, subjects were paid $10. This kind of "show-up" fee is standard practice in experimental economics. We took extra steps to ensure subjects do not construe the show-up fee as a monetary incentive. We reiterated at the practice session that once training is completed they have earned their show up fee and are free to go. We indeed observe some subjects leaving right away.

The second stage of the experiment was when volunteering took place. Subjects were told that they may stay in the lab and volunteer for any length of time up to 90 minutes. They were given a list of cities where SOW currently operates and the types of organizations they would like to partner with. Subjects then searched online for the organizations and then entered their contact information into a database. There were six database entries that could be completed for each organization: the name of a contact person, the street addresses, the phone number, email, website and a comment about why the organization would be a suitable partner for School on Wheels.[8] When volunteers finished working, they completed a survey. We discuss the survey in detail below.

Experimental Treatments

Monetary Treatment

The monetary treatment varies the monetary incentive for time spent volunteering. There are two conditions for this treatment: **no payment (NM)** or **5 cents per minute (M)**. We chose 5 cents a minute as an incentive level that is potentially small enough to induce crowding out as predicted by BT; at $3/hr this amount is less than half of minimum wage.[9]

Image Treatment

The image treatment consists of a public and double blind condition and is designed to compare public and private volunteering. In the **public treatment (PU)**, the experimenter remains in the room. It is common knowledge that all subjects may volunteer up to 90 minutes and are free to leave at any point. When a subject decides to leave she returns her materials (and receives her payment from the experimenter if the session is paid). It is common knowledge that subjects' choose how much time to spend volunteering.

[8] A screen-shot of the software used for data entry is included in the appendix. The complete database of the results of subjects' volunteer work is available at http://www.hss.caltech.edu/∼mmcconnell/orgsfound.xls.

[9] Note that our monetary treatment does not necessarily imply that we predict net crowding out. The exact interval where net crowding out happens depends on distribution of population parameters which we are unable to measure.

In order to simulate a private volunteering environment, we design a **double-blind treatment (DB)**. In this treatment, the experimenter leaves the room once the training ends. Due to lab security protocols a student monitor stayed in the room. Since the experimenter is not present during the volunteering, subjects may only ask questions to the experimenter using a chat software. The subjects pick a chat ID out of a hat and are therefore fully assured that their identity will be protected. The instructions state clearly that subjects' volunteering is completely anonymous.

After the experimenter leaves, subjects click on a button on their screen and roll a dice. This random mechanism sets the maximum limit on each subject's volunteering time, introducing the uncertainty p that was described in the theoretical section. With probability 1/6, subjects are not allowed to volunteer. With probability 2/3, this time limit is identical to that in the public treatment (90 minutes). With probability of 1/6 subjects may volunteer only up to a randomly determined limit (1-89 minutes).[10] As before, the time limit is only an upper bound and subjects can leave the lab at any point. Subjects are aware that the maximum number of volunteering minutes are randomly determined for each person through dice rolls but are not told of the probabilities. This ensures that a subject alone knows for certain if he chose to stop volunteering or if his time limit has been reached. When a subject has finished volunteering, the computer generates a random ID that is simultaneously shown to her and emailed to the monitor. The subject collects her earning from the monitor, who identifies her only with the ID.

The public and double blind conditions isolate the image benefit derived from signaling one's altruism to observers in the lab. In the field, potential image benefits are much more difficult to isolate due to challenges in controlling the interaction of volunteers with each other and observers. In empirical studies such as surveys on volunteering, the preferences to be seen as a good person may be confounded with strategic image building such as bolstering college application, resumes and career contacts. The nature of our lab task separates the two because it does not offer strategic image benefits.

Table 1 displays a summary of the experimental treatments. The image treatment varies the volunteering setting from low visibility (x_{DB}) that characterize private volunteering [11] to the high visibility (x_{PU}) condition present in public volunteering. We assume x_{PU} is strictly larger than x_{DB}. The money treatment varies the incentive y: $y_{NM} = 0$ and $y_M > 0$. Interacting the two treatments generates a total of four experimental treatments.

[10] This implies that $p = \begin{cases} 1 & \text{with probability } \frac{1}{6} \\ 1/90 & \text{with probability } \frac{1}{6} \\ 0 & \text{with probability } \frac{2}{3} \end{cases}$

[11] Self-signaling is constant across all of our treatments.

Table 1: Summary of Experimental Treatments

	Double Blind	Public
Money	M-DB: y_M, x_{DB}	M-PU: y_M, x_{PU}
No Money	NM-DB: y_{NM}, x_{DB}	NM-PU: y_{NM}, x_{PU}

Experimental Predictions

We test the three hypotheses from Section 1 by analyzing the differences in the average number of minutes spent volunteering under the four treatments.

Image Hypothesis

Among no money (NM) treatments, the public (PU) image treatment will generate more volunteering than the double blind (DB) treatment:

$$\bar{a}^{NM-PU} > \bar{a}^{NM-DB}$$

Wage-Effect Hypothesis

Among double blind (DB) treatments, the money (M) treatment will generate more volunteering than the no money (NM) treatment:

$$\bar{a}^{M-DB} > \bar{a}^{NM-DB}$$

Partial Crowding Out Hypothesis:

The response to money in the Double Blind treatments will be more positive than the response in the Public treatments:

$$\bar{a}^{M-DB} - \bar{a}^{NM-DB} > \bar{a}^{M-PU} - \bar{a}^{NM-PU}$$

Survey

A variety of empirical studies have found demographic characteristics to be important determinants of volunteering. Some field studies identify gender (Schady, 2001 and Freeman, 1995) and religious activity (Brooks, 2006) as predictors of volunteering activity. Recent experimental studies of crowding out (Mellstrom and Johannesson, 2005) find differences for men and women in their response to incentives. To control for this we developed a survey of demographic characteristics which is included in the appendix.

Our survey consists of a series of questions completed by subjects after they participate in the experiment. To control for past volunteering experience, we ask subjects

to report the length of time since their last volunteering experience, the organization they worked with, and the rating they assign to that experience. We also asked them to rate the value of the work done in the lab volunteering task. To understand subjects' expectations about perceived norms we asked them to guess the mean contribution from participants in their treatment group. The closest answer received a $20 gift certificate.[12] To control for the relevance of social connections or peer pressures, we asked the subjects to report the number of people in the room they know by name.

We also collected data on subjects' self-reported perceptions about the acceptability of monetary incentives for prosocial behavior. We asked subjects to recommend one of the following organizations to their friends: an organization that offers 5 cents per minute for volunteering or one that does not offer any money. We asked the question from the point of view of a friend to reduce subjects' incentives to signal about their own type with their answer. This question also provides an opportunity to compare survey-based evidence of crowding out to experimental evidence collected from a controlled environment.

Implementation of Experiment

The lab experiments were run in eleven separate sessions[13] with a total of 98 subjects, generating data for 79 subjects.[14] One possible concern about this design is that subjects would discuss the experiment, generating biases in behavior due to differences in prior information about the experiment. However, there is little evidence of any contamination of the subject pool or order effects in the treatments: for any given treatment, the average minutes worked is comparable for treatments run on different days. One exception is that experiments run during the week before finals and during fall break [15] seem to have lower levels of volunteering. However, our estimations indicate comparable qualitative results when we control for these periods where time is more costly.

Results

We see a range of behavior in the experiment, with some subjects leaving right away while others remain to volunteer for the entire period of ninety minutes. The distribution of

[12]Subjects perception about the mean contribution time was relatively accurate, $\frac{2}{3}$ of subjects guessed within 10 minutes of the actual mean minutes contributed by all subjects in their treatment.

[13]Five double blind sessions were run with 5,6,7,8 and 12 subjects. We see no systematic pattern of how volunteering time changes with the number of subjects in the room. All public treatments were run with 10 subjects.

[14]Double blind subjects who received a randomly assigned time limit that is binding on their decision are excluded from all reported calculations. We consider the time constraint binding when subjects stop working within 5 minutes of their time limit (5 minutes is the average time subjects take to complete the entries for one organization). Shifting this threshold in either direction within a four minute window has no effect on the results.

[15]These experiments are two sessions of Double Blind Paid, Double Blind Unpaid, and Public Paid.

volunteering choices in each of the four treatments can be seen in Figure 1. Table 2 shows the average minutes volunteered in each treatment group.

There is a clear difference in the minutes spent working when volunteering is public and when volunteering is done in a double blind environment. Consistent with the **image hypothesis**, subjects in the unpaid treatments, volunteer less in the double blind treatment.[16] When subjects can hide their decisions to quit with the random mechanism, there is less shame associated with leaving and hence less pressure to continue working. This provides evidence that volunteers in the lab derive image benefits from being observed by other subjects and the experimenter.

We now examine the implication of social signaling on the introduction of money. The **wage-effect hypothesis** predicts that when wages are introduced for volunteering performed under very low visibility, monetary concerns will dominate image concerns and volunteering will increase. Figure 1 shows that in the double blind treatment, volunteers do contribute more time when paid. However, the difference in averages between paid and unpaid double blind volunteering is not significant at conventional levels using a Wilcoxon (Mann-Whitney) test.

The difference in averages is even smaller in public volunteering. For the wage amount and visibility level that we have chosen, no net crowding out happens; average volunteering does not decrease in net when monetary incentives are introduced in either the double blind or public treatments. While the effect of monetary incentives is larger for double blind than paid volunteering, the difference is not significant. We see little effect of the monetary incentive in either double blind or paid volunteering.

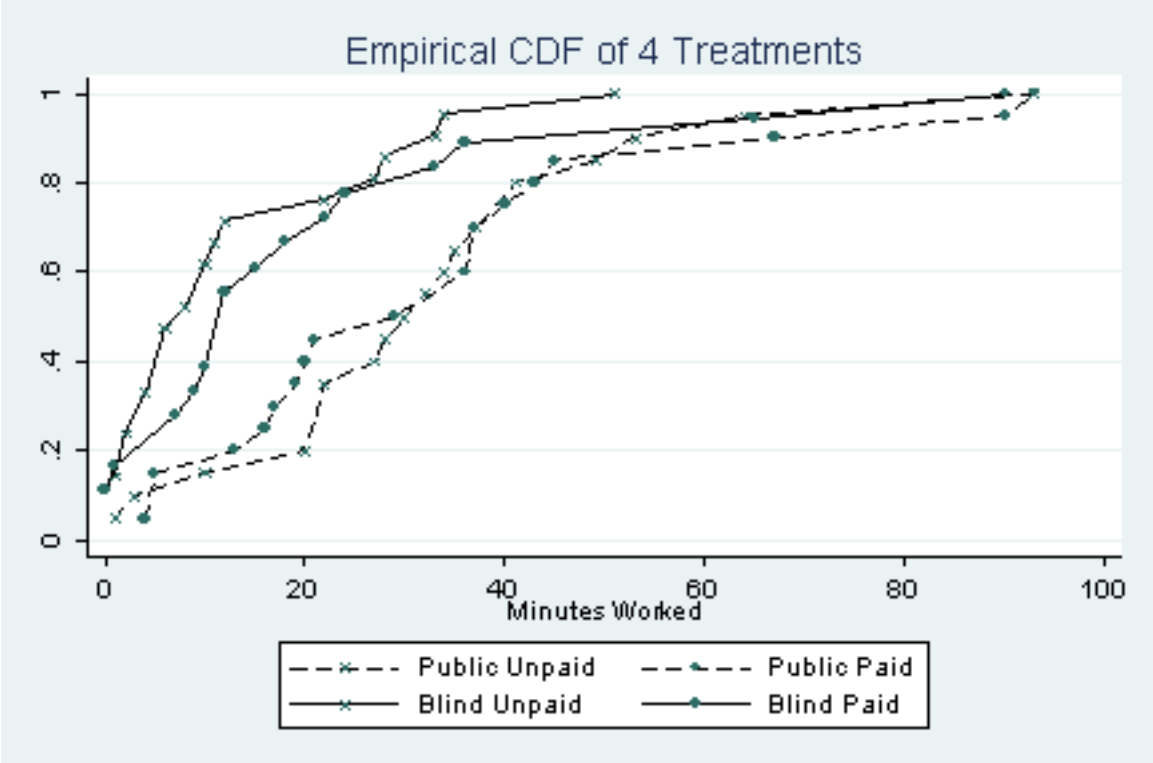
Table 2: Minutes Volunteered by Treatment Group

	no money double blind	**money double blind**
Mean	13.29	20.72
Std Err	(3.01)	(5.51)
N	18	21
	no money public	**money public**
Mean	33.20	33.65
Std Err	(4.71)	(5.67)
N	20	20

In Table 3, we estimate the impact of the treatments where the double blind unpaid treatment is the baseline condition. The coefficients represent estimates of differences in means. The **image hypothesis** is represented by the coefficient on *Public* volunteering work which is statistically significant. The coefficient on *Paid* volunteering represents the **wage-effect hypothesis**, the difference between paid and unpaid work for anonymous volunteering. This coefficient is positive but not significant. Similarly, there is little

[16]The difference is statistically significant at the 1% level using a non-parametric Wilcoxon (Mann-Whitney) test.

Figure 1: Distribution of Minutes Worked Across Treatments



empirical support in our data for the **partial crowding out hypothesis**. While the change in the amount of time volunteered is slightly more positive in the double blind treatments than in the public treatments, this difference is not statistically significant.

Table 3: OLS: Differences in means of minutes worked (DB-NM is Baseline)

Variable	Model 1 Baseline	Model 2 Covariates	Model 3 "Non-Conformists"
Public	19.914**	15.072**	19.672**
	(6.629)	(6.891)	(10.256)
Paid	7.327	6.458	6.067
	(6.815)	(6.784)	(10.050)
Public and Paid	-0.209	0.357	-0.895
	(9.980)	(9.918)	(14.571)
High Cost		-11.495**	
		(5.715)	
Male		-4.509	
		(4.957)	
Religious		1.234	
		(4.981)	
Recent Volunteering		0.343	
		(5.218)	
Network Connections		-8.181	
		(6.625)	
Intercept	13.286***	26.271	22.600***
	(4.630)	(8.674)	(7.422)
N	79	79	42
R^2	0.152	0.234	0.160

*** 1%, ** 5%, *10%

Subset of subjects that are not bounded by random time cut-off. Defined as working at least 5 minutes less than cut-off (the average time of completing the entries for one organization). Model 3 includes only subjects classified as non-conformists.

Table 4: OLS: Differences in means for productivity measures (DB-NM is Baseline)

Variable	Model 1 Entries Completed	Model 2 Productivity (Entries/Min)
Public	21.998**	0.487
	(8.821)	(0.433)
Paid	0.378	0.480
	(8.684)	(0.426)
Public and Paid	1.268	-0.645
	(12.696)	(0.623)
High Cost	-8.580**	0.457
	(7.316)	(0.359)
Male	-1.627	0.188
	(6.346)	(0.311)
Religious	0.906	-0.132
	(6.376)	(0.313)
Recent Volunteering	0.358	0.215
	(6.679)	(0.328)
Network Connections	-2.527	0.077
	(8.481)	(0.416)
Intercept	16.096***	0.216
	(11.104)	(0.544))
N	79	79
R^2	0.199	0.061

*** 1%, ** 5%, *10%

Subset of subjects that are not bounded by random time cut-off. Defined as working at least 5 minutes less than cut-off (the average time of completing the entries for one organization.

Model 2 in Table 3 includes a control, *High Cost* for experiments that occurred during unusual periods (four sessions occurred during the week before finals and during fall break).[17] In this estimation, we again see statistically significant support for the **image hypothesis** but weaker support for the **wage effect hypothesis** and the **partial crowding out hypothesis**. The coefficient on *High Cost* is negative and significant. The finding that students work less on average during the week before their finals is consistent with BT, since the increase in the opportunity cost of time would be predicted to decrease average volunteering.

In model 2 of Table 3 we also include controls for the demographic variables collected in the survey.[18] We do not include the self-reported perception measures such as the inferences about average group behavior as they may be endogenously determined. The

[17]In future work, we would like to develop an experimental measure that allows us to obtain an independent measure of the value of a student's time.

[18]One subject who finished volunteering early failed to complete the survey and we therefore impute the values for their demographic characteristics so as not to bias the results of the estimation.

results of the treatment remain significant when we control for demographic variables.[19] In general, none of the demographic characteristics has predictive power in explaining the amount of time volunteered. A test for the joint significance of all of the demographic controls yields an F-statistic of 0.95 and p-value of 0.4519. This result is surprising given results from field studies that suggest these variables are strong predictors of volunteering activity. For example, many studies have shown that women volunteer more than men – in our regression the coefficient on *Male* is indeed negative, but is not significant.

An important experimental design issue is whether the environment in the lab experiment induced the volunteers to act in a way that is comparable to natural volunteering opportunities. One concern is that some subjects who indicated that they had never volunteered before do volunteer in the lab. After conversing with the subjects at the end of the experiment, we think this may be explained by the lower cost of volunteering in the lab. All the usual volunteering costs such as searching for a cause to work for, learning the task, and traveling are not impediments in our setting.

We also examine the relationship between the number of minutes worked and subjects' self-reported valuation for the volunteering task as a measure of whether lab behavior is consistent with natural volunteering behavior. As seen in the scatter plot in Figure 2, the higher subjects rated the task, the longer they work. We then normalize this rating by subtracting the rating subject gave to their past volunteering experiment. As a whole, subjects felt that the volunteering work in the lab is not as valuable as their previous volunteering experience.[20] The normalized valuations are included in Figure 2; the strong positive relationship between the number of minutes worked and the value of volunteering remains evident with this normalized measure. The behavior in the lab is consistent with natural volunteering opportunities, where subjects that perceive their task as having a higher social value are more willing to volunteer. Intrinsic altruism explains why subjects are actually performing database searches instead of only spending time in the lab for social signaling purposes.

One alternative explanation to subjects' response to the public volunteering environment is that they may have made their decision about how much to volunteer by solely following cues from other people instead of maximizing a utility function comprising of altruism, monetary gain, and image concerns.[21] In order to control for this possibility, we identified conformists, defined as subjects who leave within two minutes of another subject. We chose to use a two minute cut-off to capture the maximum amount of time it takes for a subject to finish up an entry and complete the survey.[22] We found that there is less evidence of conformity in the double blind treatment (41%) than in the public treatment (50%). This provides additional evidence that the double blind treatment is

[19] Based on responses to our survey, the subjects were balanced on both gender (51% male) and religion (48% religious).

[20] Missing values for past volunteering experience from subjects who did not respond to this question are imputed from existing data.

[21] Goeree and Yariv (2006) show that subjects in the lab exhibit preferences for conformity, which is an intrinsic taste to follow what other people do.

[22] Similar conclusions hold if we use a one-minute cutoff.

serving its intended purpose. The higher frequency of subjects leaving in cluster in the public treatment can be interpreted as an attempt for subjects to minimize the visibility in the public treatment, which is consistent with our hypothesis that image is an important motivator for volunteers.

Subjects defined as "conformists" volunteer significantly less time: 14.2 minutes on average compared to 34.8 minutes for those who do not fit this definition ("non-conformists"). This suggests a mechanism for the effectiveness of public visibility of actions; while people with standard warm glow preferences stay in the lab and do not cue off of the behavior of others, those with lower levels of altruism are affected by social norms or social pressure. This hypothesis is further supported by observing that non-conformists report statistically significantly higher valuations of the work done in the lab.[23] Model 3 of Table 3 estimates the difference in means model for the effect of our treatments, restricted to the population of "nonconformists." As in the previous models, the **image hypothesis** is supported in the data but there is no statistically significant support for the **wage effect hypothesis** or the **partial crowding out hypothesis**.

As a last check, by examining the number of database entries completed by each individual, we verified that the number of minutes worked corresponds to a useful measure of output. Figure 3 shows the relationship between the number of minutes worked and the entries completed. The conclusions about the theoretical predictions are the same when we run a difference in means model to estimate treatment effects using the number of entries completed found as the dependent variable. These results can be found in Model 1 of Table 4.

As a further check of our model, we examine whether worker productivity is affected by our treatments. The theoretical model discussed in this paper is concerned with the amount of time volunteered but makes no prediction with respect to the quality of work completed. Image benefits are derived entirely from publicly observable behavior such as the number of minutes worked and not from any measure of efficiency. We would therefore not expect to see any effect of our treatment on the number of entries completed per minute. Model 2 of Figure 4 presents estimations that analyze whether the productivity of subjects (defined as the number of entries completed per minute) differs across treatments. The difference in mean productivity is not statistically significant for any of the treatments. The F-statistic for a test of the joint significance of the treatments is 0.49, suggesting that the treatments have no power in explaining differences in productivity.

We also consider whether subjects self-reported preferences over payment affect their behavior in the experiment. The mean volunteering across all treatments for those who prefer payment is 24 minutes while the mean volunteering for those who prefer not to be paid is 26 minutes. We conclude that there is no statistical difference between the amount of time volunteered for these two groups (t-statistic =-0.493). This result suggests

[23] Average values are 4.85 in the public treatment and 3 in the public treatment, yielding a t-statistic of 3.165 under the null hypothesis of equal means.

Figure 2: Relationship between Amount Worked and Valuation

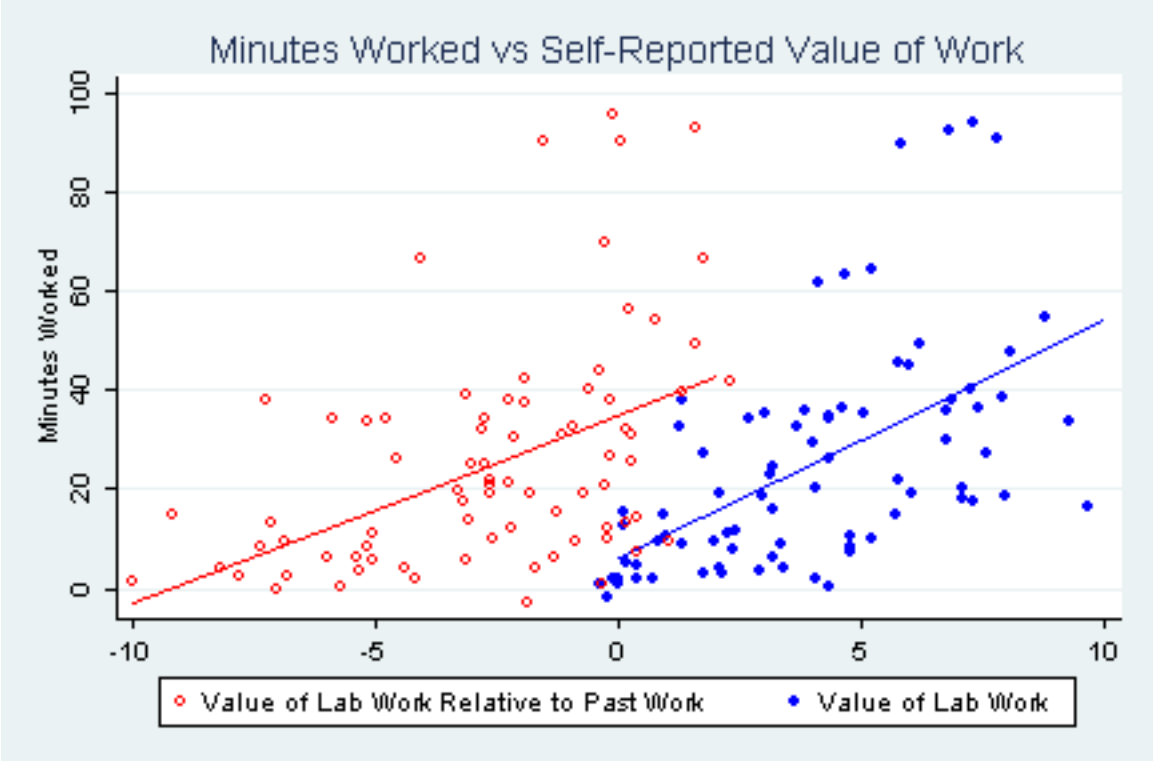
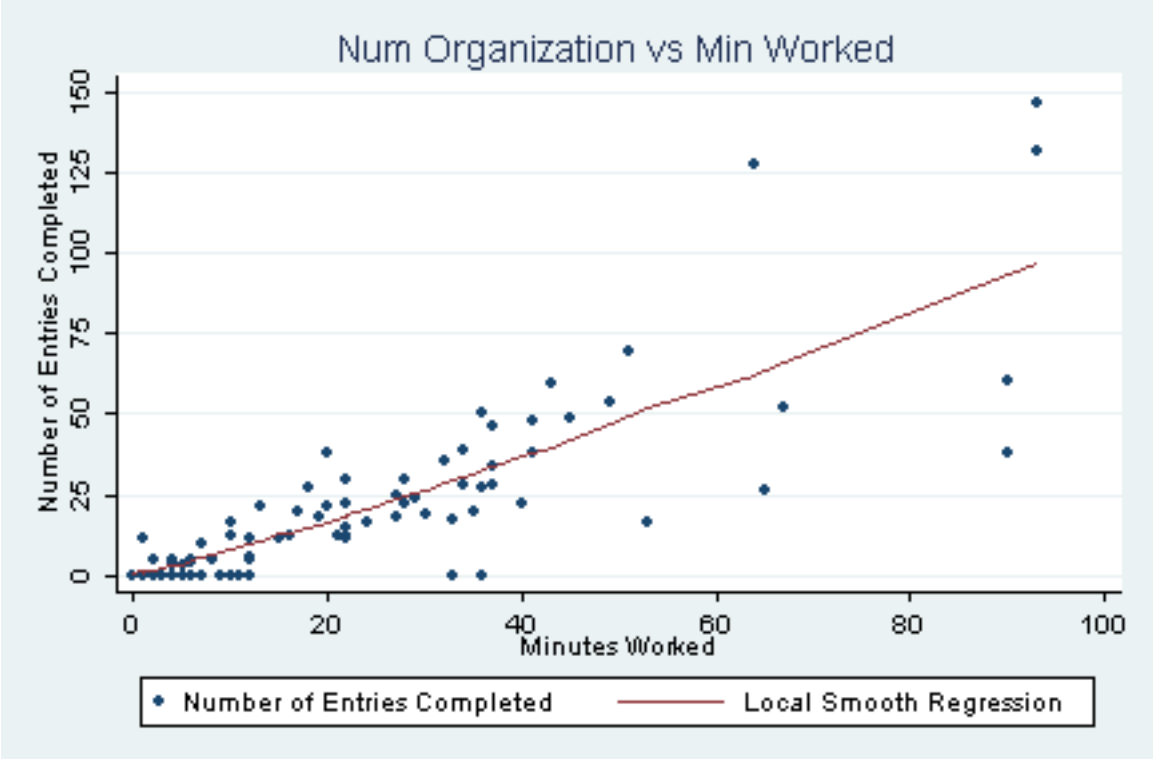


Figure 3: Relationship between Amount Worked and Output



caution for the interpretation of studies of crowding out based on hypothetical responses to questions about payment. While a preference for no payment is a reported preference for a slight majority of our subjects (41 out of 79 subjects), we see no actual effect of payment on subjects' behavior.[24]

Conclusion

Volunteering is a widespread and important activity in the non-profit sector. While a large body of literature studies financial contributions to non-profits,[25] little work has been done to investigate the motivations of volunteers. Volunteers work in institutional settings with varying degrees of public recognition. In one extreme, volunteering is private and volunteers can hide their lack of contribution from both observers and the coordinator. In public volunteering, on the other hand, volunteers decisions to quit are directly observable by other volunteers and the coordinator.

By working closely with nonprofits, we map these real world characteristics into a theoretical model that can be tested in a carefully controlled setting. By ensuring that our subjects are directly engaged in the operation of the nonprofit, we retain the context of an actual volunteering activity. The lab setting allows us to provide uniform information about the cause and training on the task at hand. More importantly, it allows us to control both the privacy of the volunteers' actions as well as accurately and precisely measure the amount of time volunteered and the amount of output produced by volunteers. What we find is that both altruism and image concerns motivate volunteer work. Examining both the amount of time worked and the quantity of work completed, we conclude that volunteers are willing to work more in the public setting, when their decision not to contribute would be observed by other subjects. We observe no statistically significant support for partial crowding out; volunteers who are working on tasks advancing the social mission of the nonprofit exhibit little response to monetary incentives in both public and private setting.

Furthermore, we see that only observable measures of volunteers' effort such as the amount of time spent working are affected by our image treatments; the amount of work completed per minute (productivity) does not differ across the public and private setting. This provides further support for a theoretical model where volunteers are motivated to work partly out of the concern for their image; image treatments that focuses on the absolute amount of time donated do not have a similar effect on the quality of the work done.

Our research makes several contributions. First, it provides evidence on the importance of social signaling in volunteering. Second, it provides experimental evidence that suggests that organizations have more to gain by catering to volunteers' image concerns

[24] We also consider the effect separately in each treatment and generate the same conclusion.

[25] A small subset of recent field experimental research on financial contributions to charities includes Karlan and List (2006), Landry et al (2006) and Shang and Croson (2005).

than by providing monetary benefits. Third, it shows that by more closely involving practitioners in experimental design, the unique features of lab experiments can be used as an advantage in studying prosociality.

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